IN THE DRAWINGS:

The attached two sheets of drawings includes changes to Figs. 1a, 3, 4, 5, 7, 8, 10, 11, and 12. The [REPLACEMENT] sheet of each of those Figs. replaces its respective Fig. sheet (e.g., [REPLACEMENT] Fig. 1a replaces original Fig. 1a). Figs. 1a, 3, 4, 5, 7, 8, 10, 11, and 12 are amended to not contain captions to the drawings.

Attachment(s): Replacement Sheet (Fig. 1a)
       Annotated Sheet Showing.Changes (Fig. 1a)
       Replacement Sheet (Figs. 3 and 4)
       Annotated Sheet Showing Changes (Figs. 3 and 4)
       Replacement Sheet (Figs. 5 and 6)
       Annotated Sheet Showing Changes (Figs. 5 and 6)
       Replacement Sheet (Fig. 7)
       Annotated Sheet Showing Changes (Fig. 7)
       Replacement Sheet (Fig. 8)
       Annotated Sheet Showing Changes (Fig. 8)
       Replacement Sheet (Figs. 10 and 11)
       Annotated Sheet Showing Changes (Figs. 10 and 11)
       Replacement Sheet (Fig. 12)
       Annotated Sheet Showing Changes (Fig. 12)

REMARKS

Entry of this Amendment is respectfully requested. No new matter is added. The above-amended Figs. originally contained captions. This Amendment serves to conform the Drawings to the U.S. Patent and Trademark Office rules more completely.

If any fees are due in connection with this Amendment, the Commissioner is authorized to charge and/or credit the **Kenyon & Kenyon Deposit Account No. 11-0600.**

A duplicate of this Transmittal is included for such purpose(s).

Dated: May 25, 2005

By: Richard Mayer

By: *[signature]* Reg. No. 47084

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$L(\mathbf{u})$

$L_c \cdot \mathbf{y}$

"Soft-In Soft-Out"
-Decoder

$L_e(\hat{u})$

$L(\hat{u})$

Fig. 1$_a$: ~~"Soft-In Soft-Out" -Decoder~~

$\mathbf{v}$ → outer encoder → $\mathbf{u}$ → Π → inner encoder → $\mathbf{x}$ ⊗ ⊗ → $\mathbf{s}$

direct sequence spreading

quadrature scrambling

Fig. 1b

$\hat{v}$ ← COD SOVA ← Π^{-1} ← ⊕ ← MAP (FHT) ← RAKE MRC ← r

$L_c y + L_e^I(\hat{u})$

$L_c y$ coherent

outer decoder

inner decoder

⊕ → Π

$L^O(\hat{u})$

$L_e^O(\hat{u}) = L^I(u)$

Fig. 2

$$L(\mathbf{u})$$

$$L_c \cdot \mathbf{y}$$

$$\oplus$$

$$\boxed{\text{FHT}}$$

$$\mathbf{w}$$

$$L_c(\tilde{\mathbf{u}})$$

$$L(\tilde{\mathbf{u}})$$

$$\boxed{\ln \dfrac{\sum\limits_{j,\,u_i=i} z_j}{\sum\limits_{j,\,u_i=1} z_j}}$$

$$\mathbf{z}$$

$$\boxed{\exp(\tfrac{1}{2} \cdot w_j)}$$
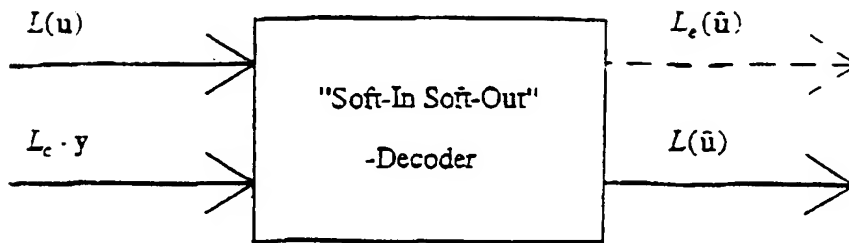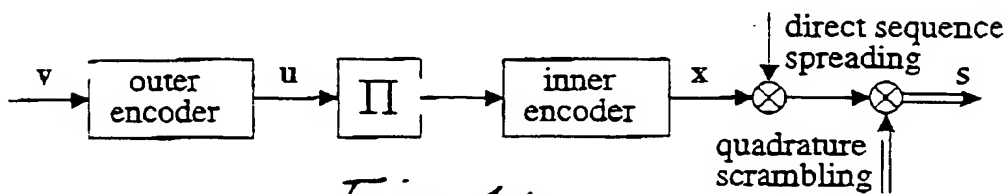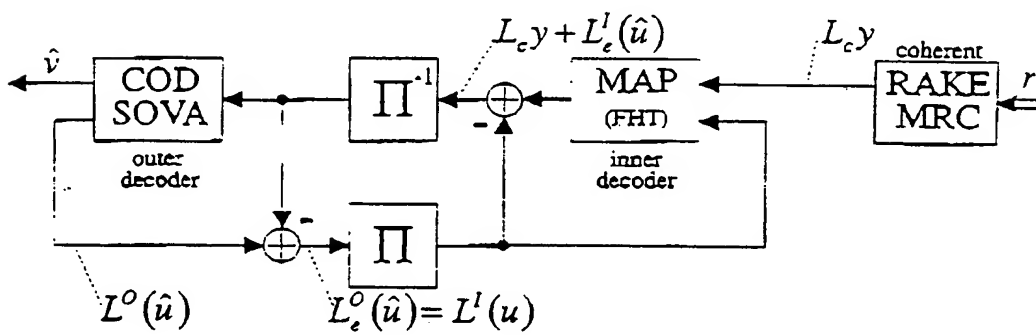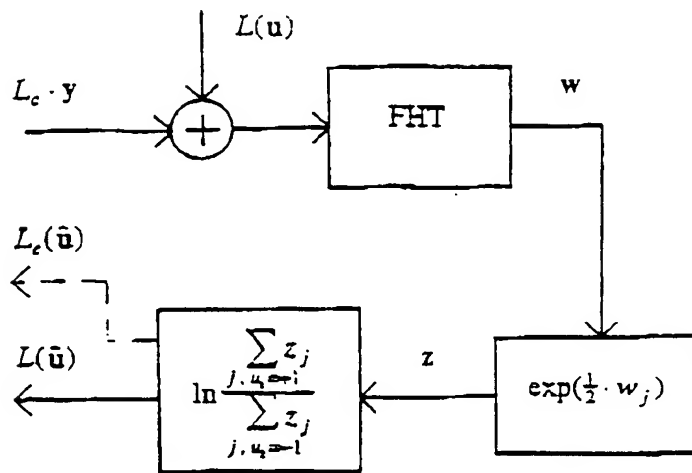
Fig. 3 : ~~Decoderstruktur für den inneren Hadamard-Code~~

$$\ln 2$$

$$\varepsilon$$

$$4 \ln 2$$

$$(W_{max} - W_{max})$$
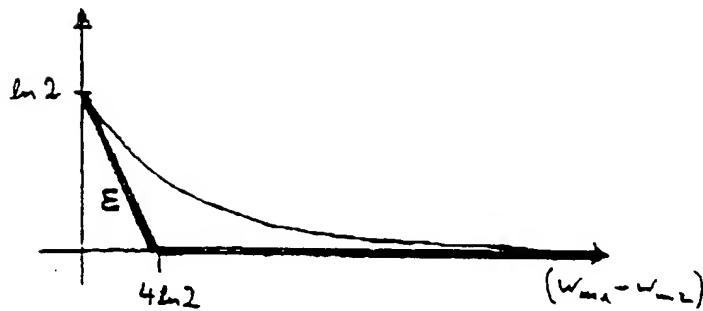
Fig. 4 : ~~Verdeutlichung der Näherung für ε~~

$$\hat{x}_{a,j-\delta,n}$$

$j-\delta$ $\qquad$ $j-l$ $\qquad$ j

i_{ML}

$M_j^{i_{ML}}$

Δ_j^δ $\qquad$ Δ_j^l $\qquad$ Δ_j^0

s^c

$x_{a,j-\delta,n}^l$ $\qquad$ $x_{a,j-l,n}^l$

$x_{a,j-\delta,n}^0$

i'_{ML}

s^1

s^2

s^3
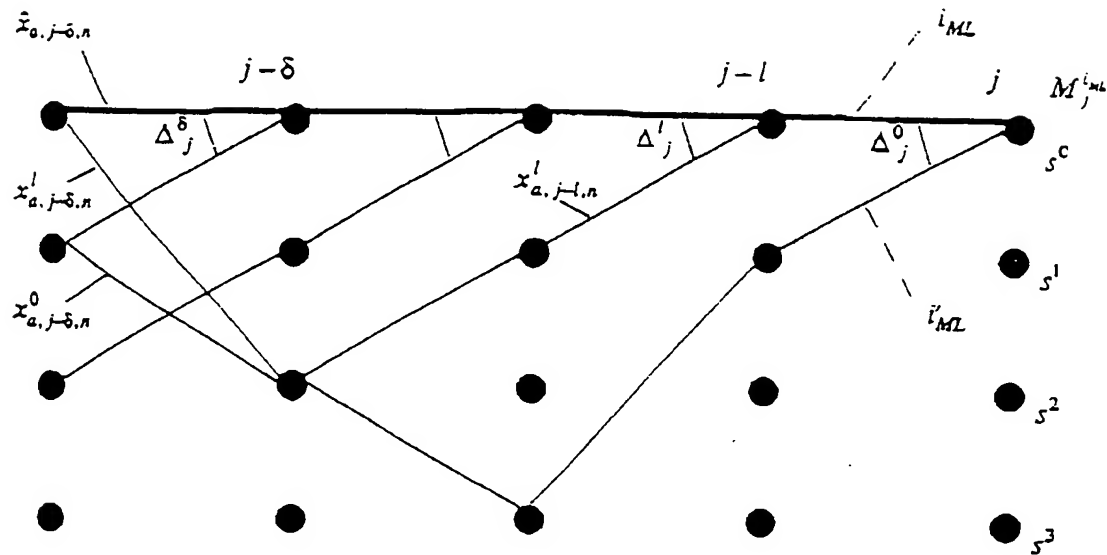
Fig.5 ~~: Trellisdiagramm mit verworfenen Pfaden entlang des Maximum-Likelihood-Pfades~~

QPSK uncoded
ML dec. inner code
MAP dec. inner code
1. iteration
5. iteration

bit error rate

1.0e-01

1.0e-02

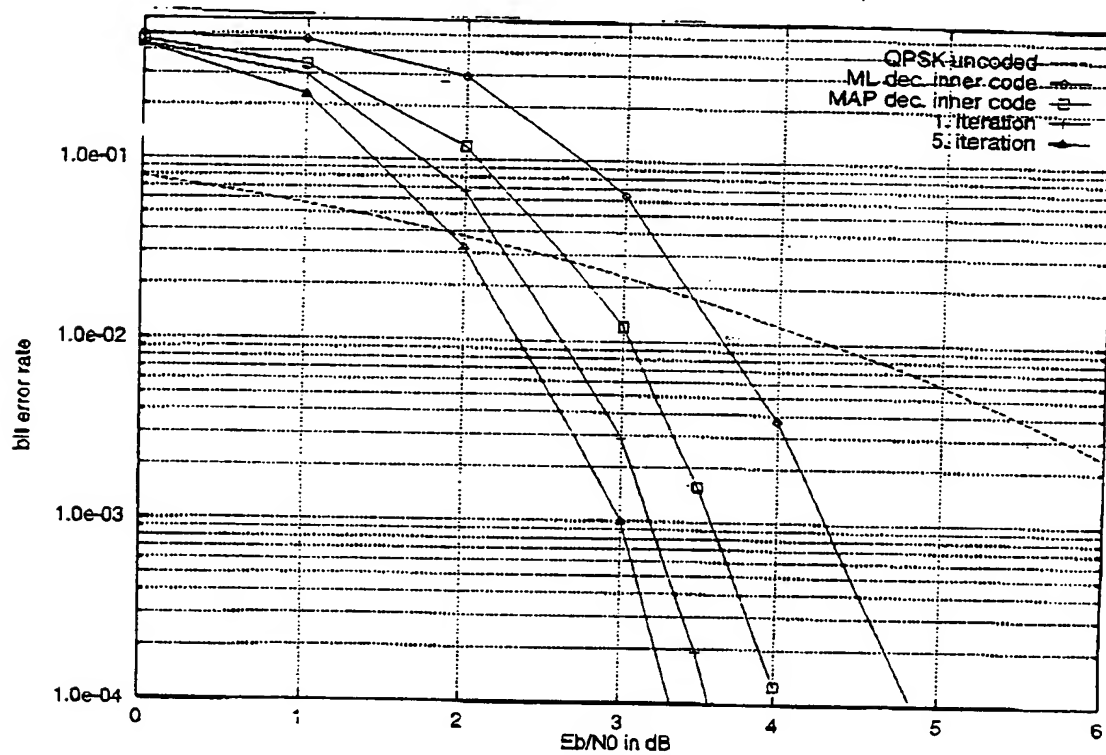1.0e-03

1.0e-04

0 1 2 3 4 5 6

Eb/N0 in dB

Fig. 6

[ANNOTATED SHEET]

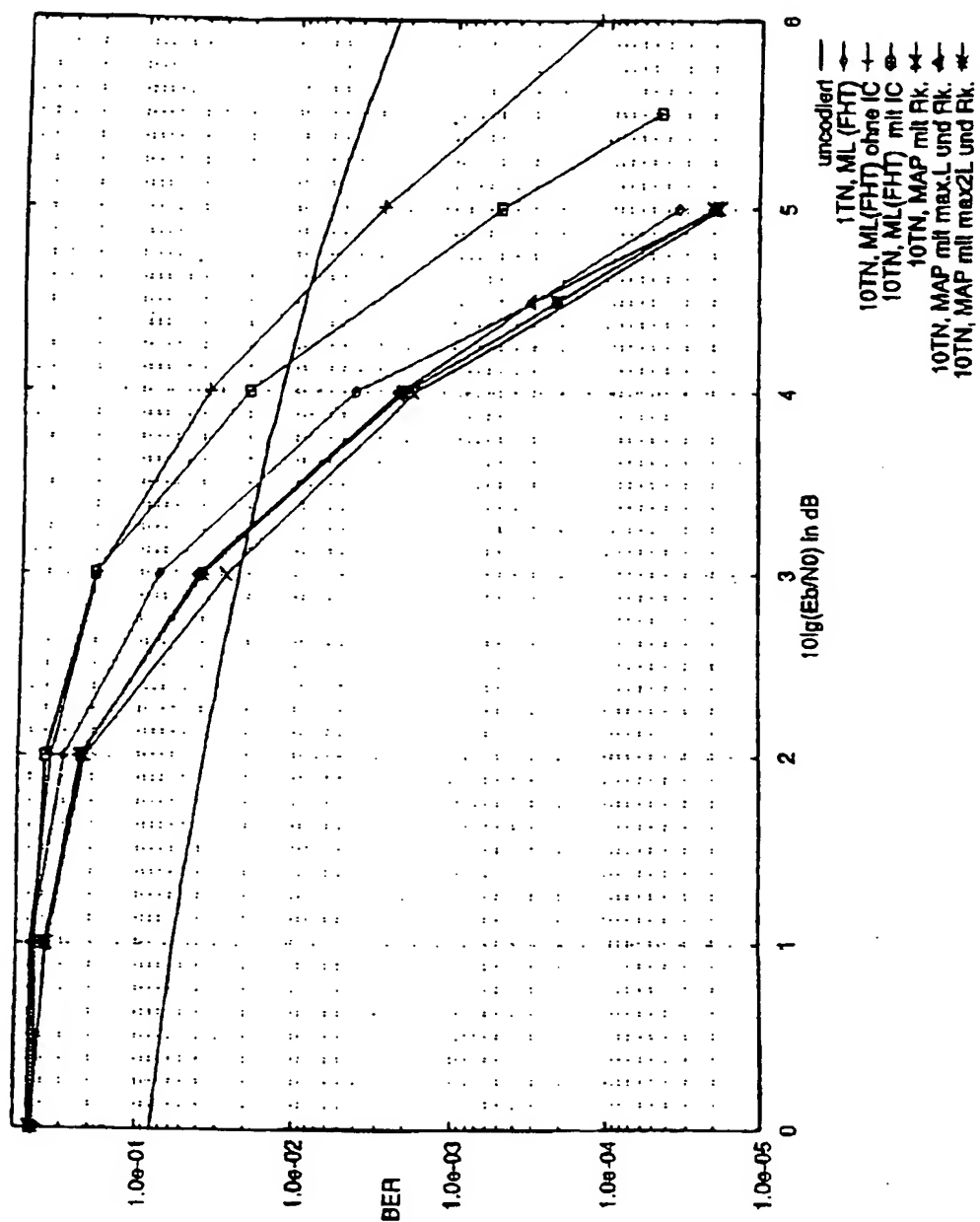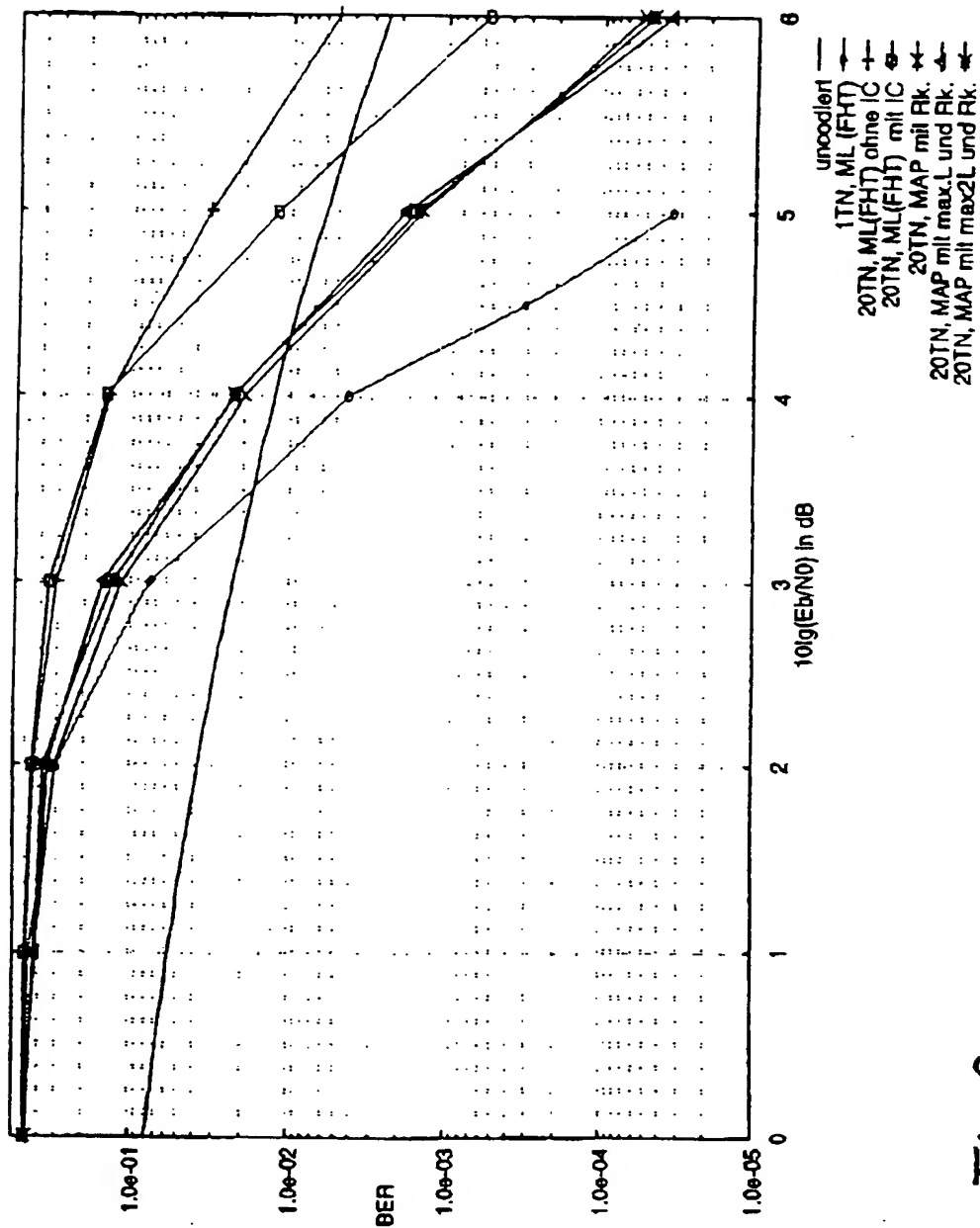Fig. 7: Vergleich der IC mit einem System mit MAP-Decodierung, mit Verwendung der Vereinfachung, AWGN, U=10, $J_{ges}=128$

Legend:
- uncodiert
- 1TN, ML (FHT)
- 10TN, ML(FHT) ohne IC
- 10TN, ML(FHT) mit IC
- 10TN, MAP mit Rk.
- 10TN, MAP mit max.L und Rk.
- 10TN, MAP mit max2L und Rk.

Axes:
- x-axis: 10lg(Eb/N0) in dB
- y-axis: BER (1.0e-01, 1.0e-02, 1.0e-03, 1.0e-04, 1.0e-05)

BER

1.0e-01

1.0e-02

1.0e-03

1.0e-04

1.0e-05

0   1   2   3   4   5   6

10lg(Eb/N0) in dB

uncodiert
1TN, ML (FHT)
20TN, ML(FHT) ohne IC
20TN, ML(FHT) mit IC
20TN, MAP mit Rk.
20TN, MAP mit max.L und Rk.
20TN, MAP mit max2L und Rk.

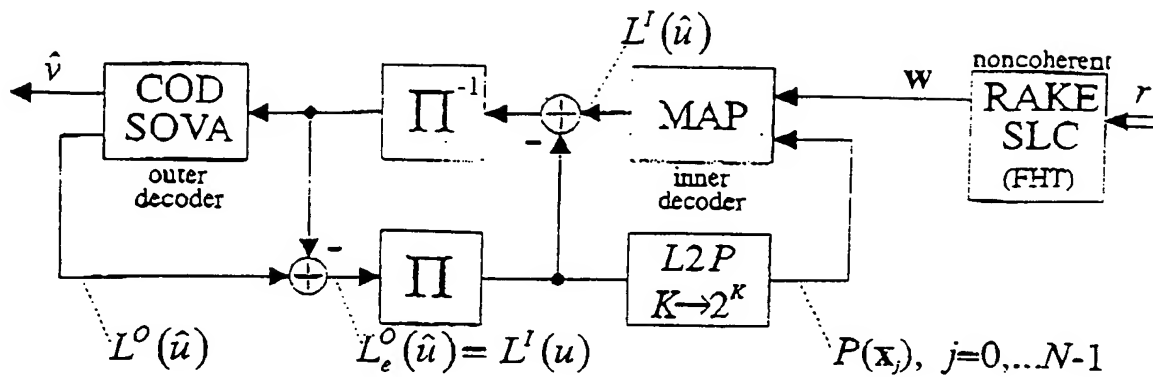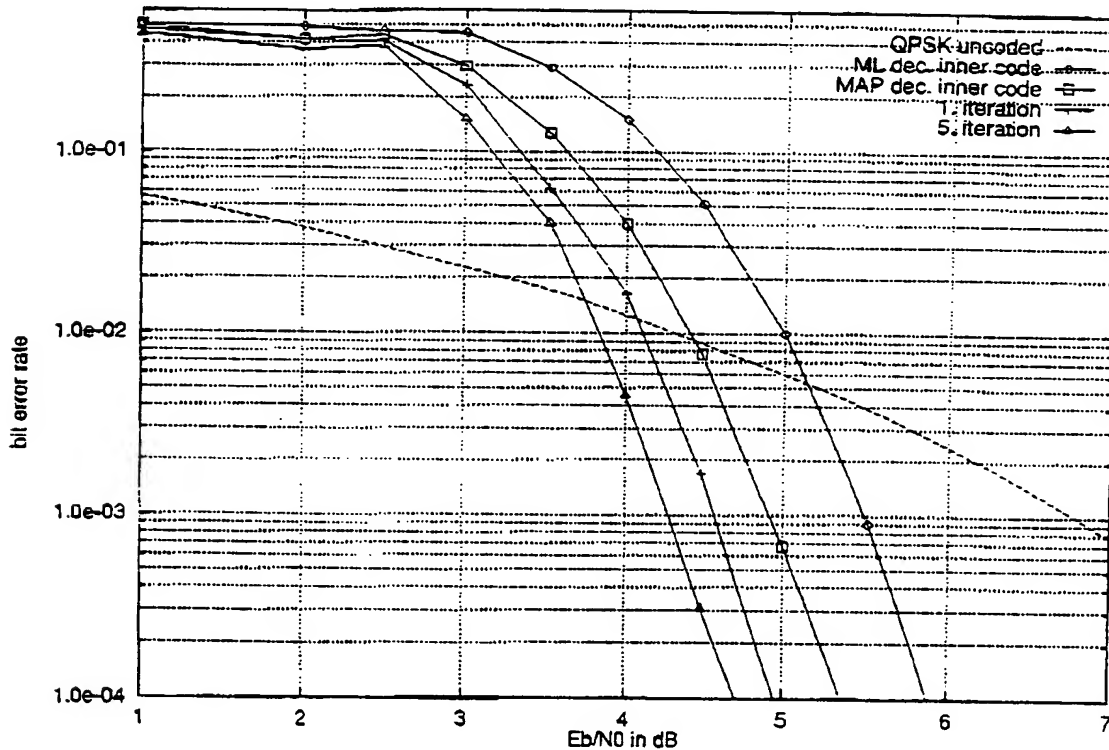*Fig. 8.* Vergleich der IC mit einem System mit MAP-Decodierung, mit Verwendung der Vereinfachung, AWGN, U=20, J_{ges}=128

$$L^I(\hat{u})$$

$$\hat{v} \quad \boxed{\begin{array}{c} \text{COD} \\ \text{SOVA} \end{array}} \quad \boxed{\Pi^{-1}} \quad \oplus \quad \boxed{\text{MAP}} \quad \mathbf{w} \quad \boxed{\begin{array}{c} \text{noncoherent} \\ \text{RAKE} \\ \text{SLC} \\ \text{(FHT)} \end{array}} \quad r$$

outer decoder

inner decoder

$$\boxed{\Pi} \qquad \boxed{\begin{array}{c} L2P \\ K \to 2^K \end{array}}$$

$$L^O(\hat{u}) \qquad L_e^O(\hat{u}) = L^I(u) \qquad P(\mathbf{x}_j), \; j = 0, \ldots N-1$$

Fig. 10

Iterative decoding in the noncoherent receiver.

QPSK uncoded
ML dec. inner code
MAP dec. inner code
1. iteration
5. iteration

bit error rate

Eb/N0 in dB

Simulation results for the noncoherent RAKE receiver.   *Fig. 11*
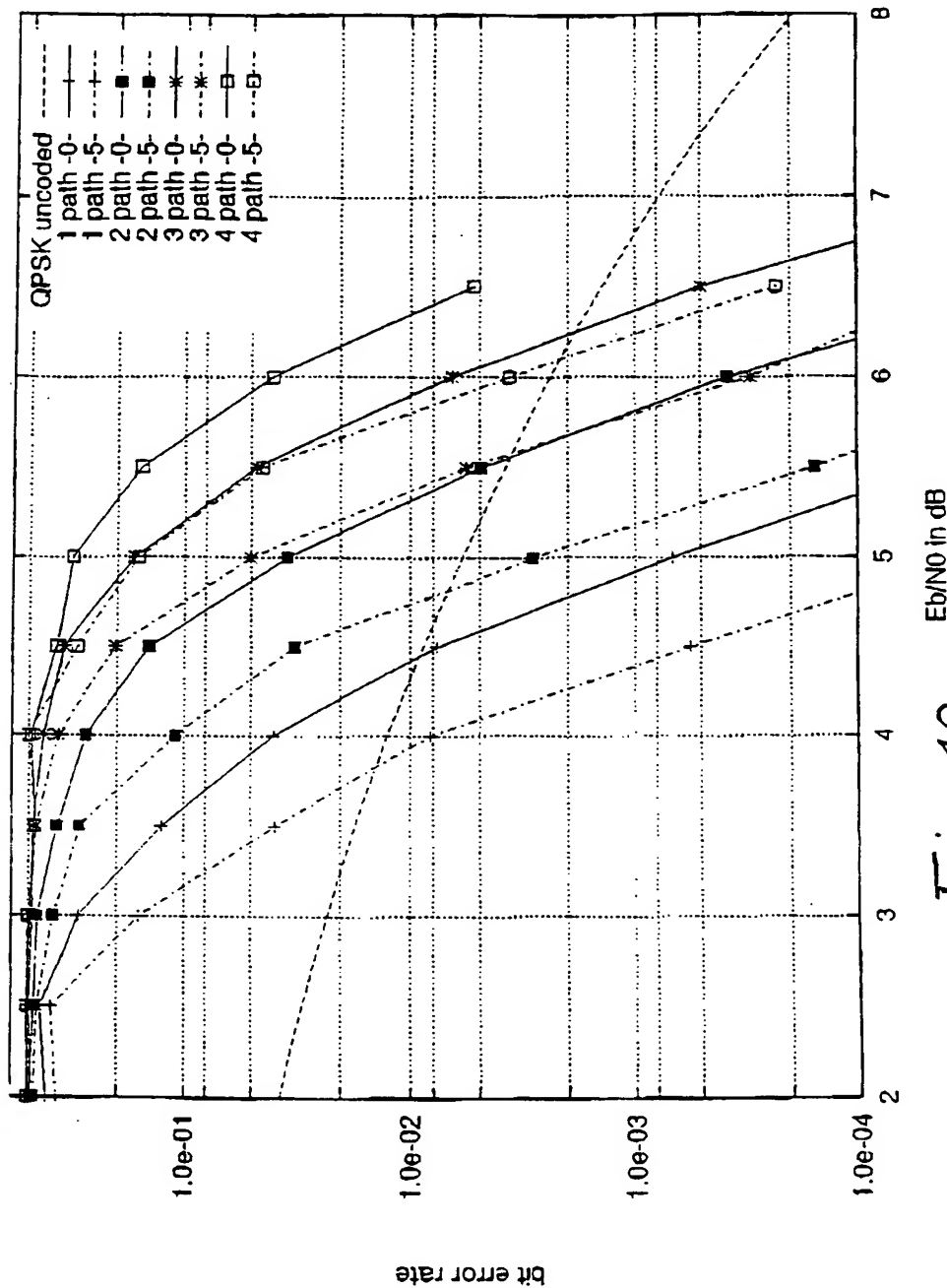
[ANNOTATED SHEET]

Fig.12

Simulation results for the noncoherent RAKE receiver with several static multipath channels and MAP decoding without (-0-) and after the 5th iteration (-5-).